Kenya Digital Schools

Phase 1 Final Report

December 2021

Introduction

The Kenya Digital Schools project has been working to improve teacher, student and educational outcomes at 10 Secondary schools across Naivasha. This has been achieved by installing fully-functioning computer labs at each of the 10 schools and 3 teachers from each of the schools have taken part in ICDL training to improve their ICT competence.

Computer labs were installed from July to September 2021, and due to changes in the Kenyan schooling year caused by COVID, students have been able to start accessing the computer labs sooner than expected.

Following the completion of the computer labs, this allowed students to access and complete the Student Baseline Survey between September - October 2021, with a total of 152 student responses across all schools. On average, 15 students from each school completed the survey. Principals also completed School Metrics surveys.

A video showcasing the project can be found here: https://drive.google.com/file/d/1-KpTDI_aT00VsoX8XyebM4ONMOJpOToc/view?usp=sharing

Output Progression

November 2019 - November 2021

School Selection & Refurbishment

Schools selected for the project were chosen based on a number of criteria including their need for modernising and infrastructure improvements, their capacity for equipment, and their ability to successfully sustain the labs.

Additionally, five schools labs have undergone refurbishments in the last 6 months (prior to computer lab installations) in order to better prepare rooms for hosting the equipment. This consisted of window and door reinforcements, skim plastering and painting, and sourcing furniture. The schools committed their own funds to the process which shows their level of commitment to the project. In total, 235,600 Kenyan shillings (approx. £1,553) was spent across the schools.

Teacher Laptop Delivery

Laptops for teachers were distributed to the schools in Naivasha in November 2020 shortly before the start of ICT training. Teachers were utilising these laptops in order to take part in online ICDL training through Google Meet, with ICDL trainer Martin Kuria.

Teacher ICDL Training

Teacher ICDL training was originally meant to occur in person, but due to the pandemic, the training was adapted to take place online. The 30 teachers across the 10 schools began online training in November 2020 and concluded in December 2020. The teachers covered 6 modules in total covering Computer Essentials, Online Essentials, Word Processing, Spreadsheets, Presentations, and ICT in Education. The results from the ICDL teacher assessments are presented on Page 12 of this report.

Teacher Baseline Survey

The teacher baseline survey was conducted during a Google Meet ICDL training session on the 11th of December. The link to the survey was shared on the Google Meet and teachers began completing the survey. The results of this survey are presented on Pages 5-7.

Computer Lab Installations

Computer lab implementation began on the 26th July across the schools. ICT equipment was delivered sequentially to each of the schools, and installation followed the day after. The installation included not only computers and monitors, but also setting-up all assistive technology. All labs were setup by the end of September 2021.

Student Baseline Survey

Students began completing the baseline survey in the last week of September and all survey responses were received by 18th October 2021. As mentioned, the survey was completed by 152 students in total with a fairly even split between male and female students. The results of the student survey are explored on Pages 8-10.

Principal Metrics Survey

The School Metrics surveys were completed by principals across all schools between September and October 2021. This survey focuses on data around student and teacher attendance, absence, retention and also student grades in key STEM subjects. Data will be collected again to see how these metrics alter over the course of the project. Summary of metrics data is presented on Page 11.

Teacher Certification Ceremony

On Thursday 14th October 2021, the Kenya Digital Schools project was officially launched with the opening ceremony and teacher certification ceremony at Enaiposha Girls High School. Teachers from all the schools attended the ceremony and participants from Computer Aid and SITA also joined online through Zoom. A member of the Ministry of Education also joined the ceremony to commemorate the project.

Teacher Baseline

A summary of the key quantitative and qualitative data from the teacher baseline survey is presented below. Chart 1 shows that most teachers are teaching Secondary Grades 10 & 11, so ages 15 - 17. Chart 2 indicates that 97% of teachers teach Maths, Science, or Languages. Many teachers teach numerous subjects including maths and science, but few (10%) teach Computer Studies.

Chart 1: Teacher Grades

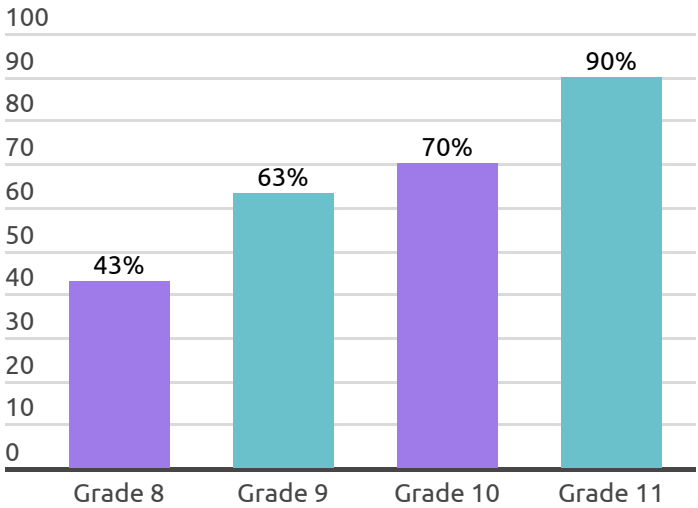
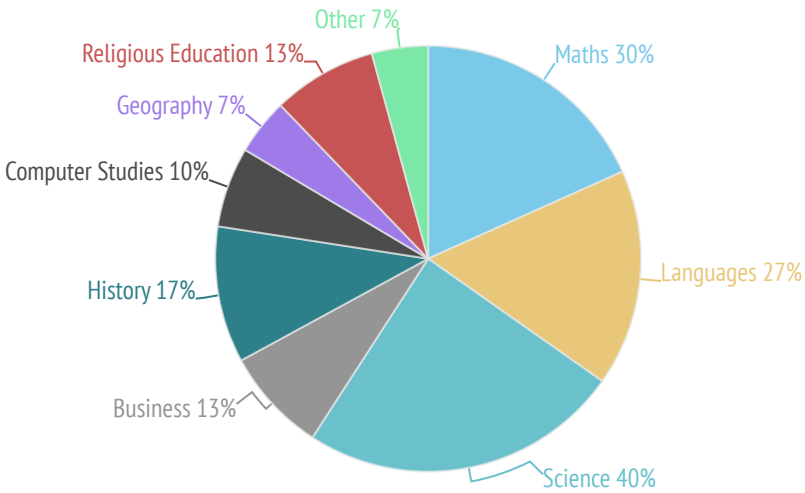


Chart 2: Teacher Subjects



Mayoyo Ondigo Erick, Grade 9-11 Teacher *at Mirera High School*

"I currently prepare lessons by reading books in the library then extracting what is useful for the Kenyan syllabus."

When asked how useful the ICDL training will be, 97% of teachers responded 'Very Beneficial' with a quote below explaining why this was the case.

James Kamau Macharia, Grade 10 & 11 Teacher *at Enaiposha Girls High School*

"The training will equip me with the modern ICT skills that will be helpful in research, lesson preparation and presentation to learners."

Chart 3: Teacher ICT Skill Confidence

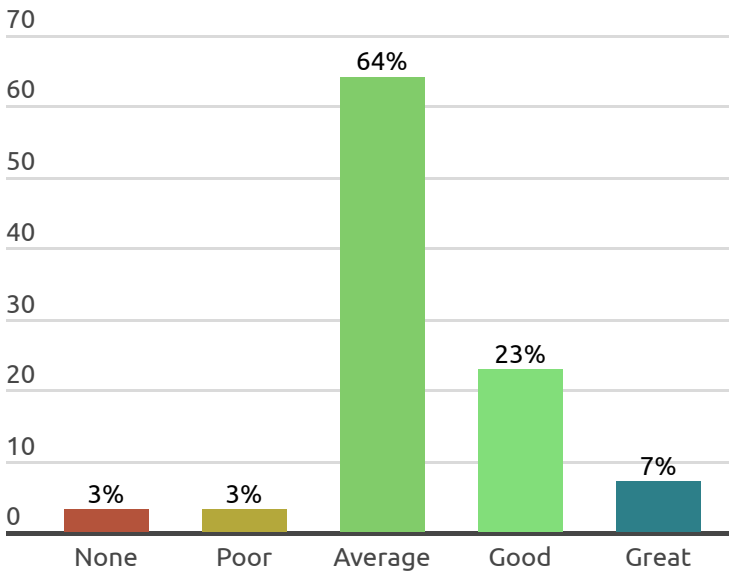


Chart 3 shows teacher confidence levels in ICT at the Baseline Survey. 64% of teachers state they have 'Average' skills with only 3% stating they have 'None'. The majority of teachers have previously used a computer, and 23% categorise themselves as having 'Good' computer skills.

Chart 4: Student Class Indicators

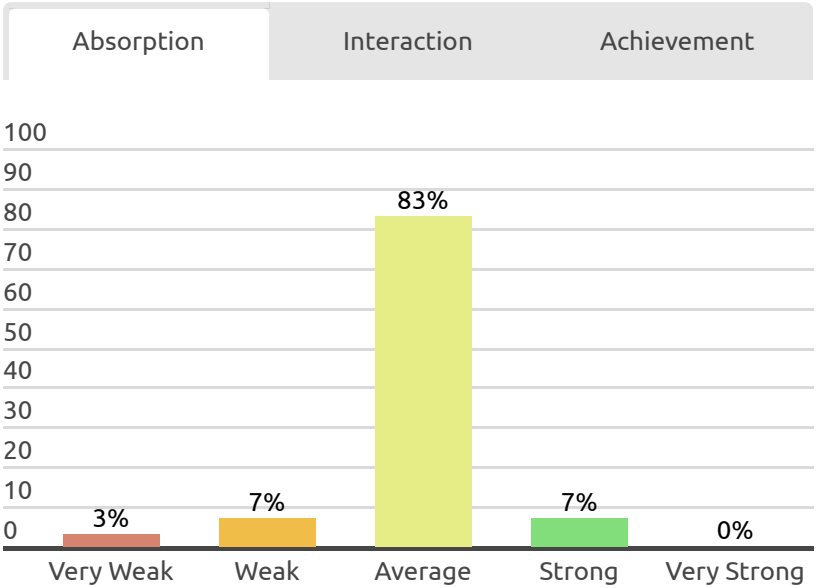
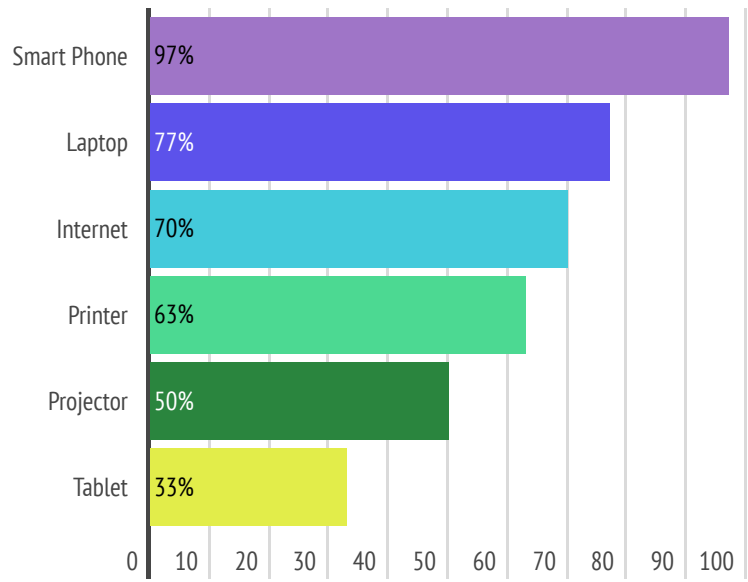


Chart 4 indicates teacher ratings for various student indicators in classrooms. Student absorption in classes across schools was mostly rated (83%) as 'Average.' Levels of student interaction in classes was similarly rated, with 67% of of teachers choosing 'Average.' Finally, achievement levels in classes were also mostly rated (73%) as 'Average.' Therefore, there is plenty of scope for improvements in these student indicators over the course of the project.

Chart 5 below show which types of technology teachers have previously accessed.

Chart 5: Teacher Previous Device Access



Student Baseline

A summary of the key quantitative and qualitative data from the student baseline survey is presented below. Students across the 10 schools started completed surveys in Late September and this finished in mid-October. A total of 152 students completed the survey, with an average of 15 students from each school. Among respondents, 54% were male and 46% were female. The students also form a fairly even mix across school grades, with most students in Grade 9 (23%). When asked if they'd ever used a computer outside of school, 34% of students surveyed replied 'No' indicating that this project is providing them with the first opportunity to access computers.

Chart 6 shows how often students are accessing their computer labs both during class and outside of class. Most students completing the survey are accessing the computer lab for classes weekly (55%). Around 18% are yet to access their labs yet for a class, but installations occurred shortly before surveys were completed. Outside of class, 39% of students are accessing the computer lab weekly, whilst 36% are yet to access.

Chart 6: Student Lab Access

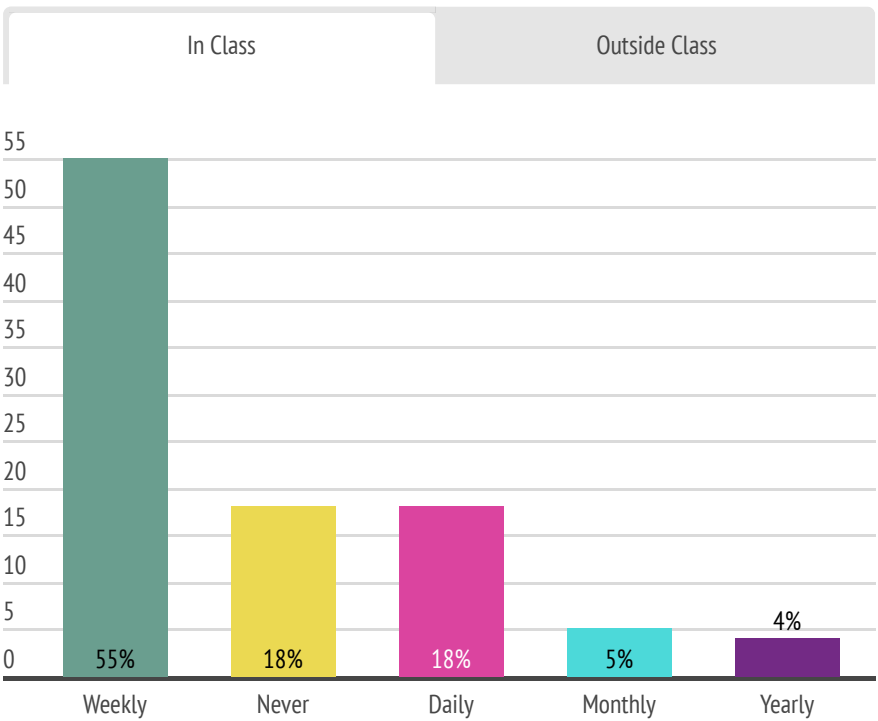


Chart 7: Duration Of Student Lab Access

In Class | Outside Class

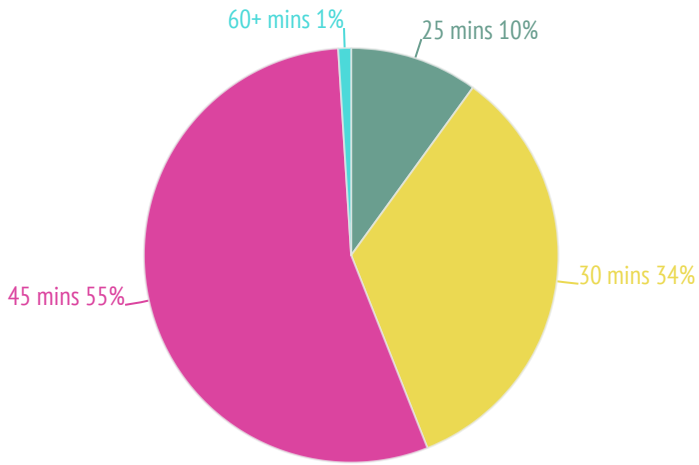


Chart 7 shows the duration of access for students both inside and outside of classes. In class, most students (55%) are accessing the lab for 45 minutes. Outside of class, 46% of students are accessing the lab for 30-60 minutes.

Relating to activities in the computer lab, 93% of students are using word processing software in classes, and internet browsing is also a popular activity in classes, with 53% of respondents stating this. Across the schools, 53% of students are sharing a computer with one other classmate, whilst 13% are able to use a machine on their own.

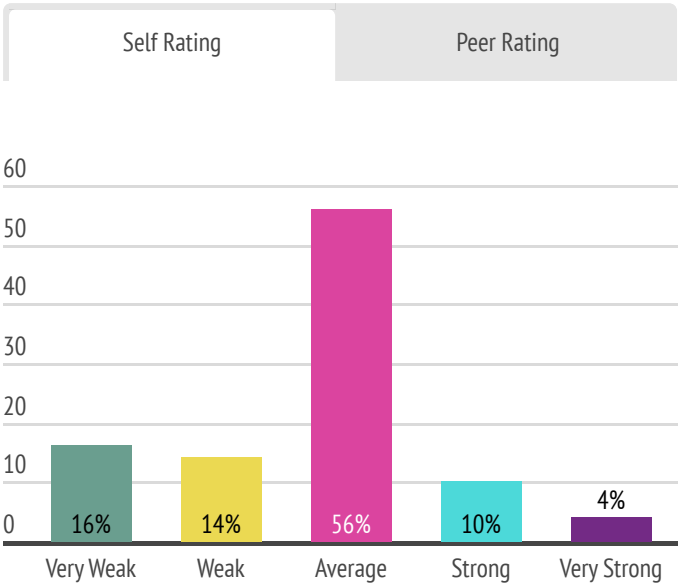
Jenery Wambugu, Grade 10 Student *at Nyakairu Senior Secondary School*

"The computers will will help me manage my time well, as I am eager to learn more in my extra time."

Benson Kimari, Grade 12 Student *at North Karati Secondary School*

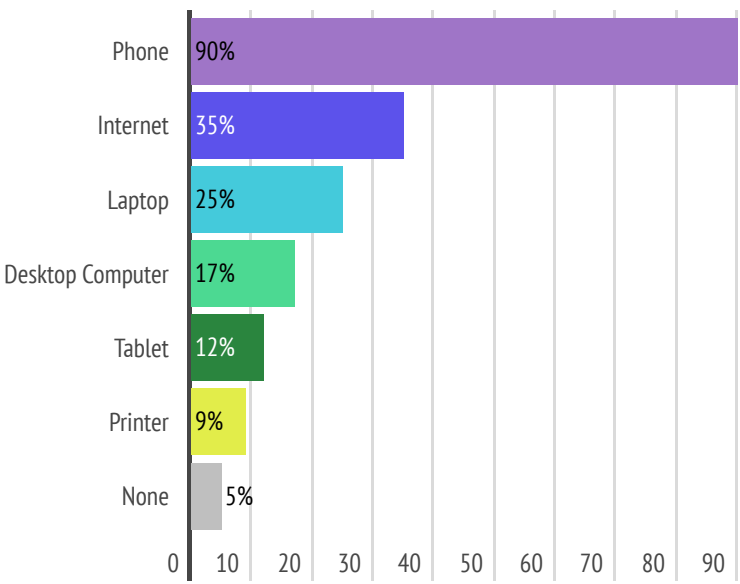
"There are limited resources and information at our school due to a lack of computers."

Chart 8: Student IT Confidence



Students were asked to rate their ability with computers, and also rate their peers. Chart 8 shows the data from these responses. The majority of students (56%) classify themselves as having 'Average' computer skills, with 16% stating their skills are 'Very Weak'. Students generally rate their peers as having similar computer skills or worse, with 63% rating their peers as having 'Average' skills.
Chart 9 shows device usage outside of school, with 90% of students accessing a phone, and only 5% of students have not accessed any device listed.

Chart 9: Device Access Outside Of School



Metrics Survey

The School Metrics survey was completed by each of the school principals between September and October 2021. The data relates to the 2019 academic year because COVID led to closures in 2020 and therefore there is minimal data on last academic year's performance.

On average across the schools, teacher attendance is high with 99.8% of total school days being attended by teachers. Teacher Retention across all schools is 98.5% with Naivasha Mixed Secondary School having the lowest rate with 10% of their teachers leaving the school in that academic year. Student attendance is also surprisingly high with an average rate of 98.5%.

Average grades across schools are quite poor, with the average STEM score being 47%. The average score for Maths is 42%, Science is 48%, and English is 53%. This is a similar pattern we observed in Zambia, where Maths grades are the lowest, Science grades are slightly higher and English grades are highest.

Schools had an average of 197 school days, an average of 36 teachers, and an average of 592 students. The 3 schools with the largest student cohorts are Milimani High School. Mirera High School, and Naivasha Day Secondary School.

Overall ICDL Results

The table below shows the results for all ICDL assessments, from a total cohort of 30 teachers. The results indicate that at least 90% of teachers have passed each module offered to them.

MODULE TYPE	MODULE	NUMBER OF PASSES	NUMBER OF FAILS	HIGHEST SCORE	AVERAGE PASS SCORE
Base	Computer Essentials	30	10	97%	85%
Base	Word Processing	29	19	100%	86%
Base	Online Essentials	30	3	100%	85%
Base	Spreadsheets	29	6	100%	86%
Intermediate	ICT In Education	27	7	100%	87%

Case Studies

Peter Maina Kariuki, Grade 11 Teacher *at Nyonjoro Secondary School*

Peter was the top performing teacher in ICDL modules, passing all 6 modules on his first attempt, with an average score of 95%. He scored 97% in the Presentations module and 100% in the ICT in Education module. He teaches Physics and Mathematics to classes of 30 students per week. Before the project he was manually preparing notes for classes.

Quote: "The ICDL training and qualification will enable me prepare lessons using ICT."

Sarah Jebet Ruttoh, Grade 8-11 Teacher *at Magereza Academy*

Sarah was the top performing woman in ICDL modules, passing all 6 modules on her first attempt, with an average score of 89%. She scored 94% in Online Essentials and Presentations, and scored 100% in Spreadsheets. She teaches Kiswahili and Christian Religious Education to a total of 450 students per week.

Quote: "ICDL certification has enabled me to be part of the information society, as it has raised my level of competence in using computers, devices and common computer applications in the delivery of content to my learners and has also raised computer literacy amongst the learners. The course has helped me to understand the best practices and the advantages of using computers and devices."

SUSTAINABLE DEVELOPMENT GOALS

Quality Education

This project contributes to Target 4.4 of SDG 4 which states:
By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship.

Both teachers and students at project schools are directly gaining and have the opportunity to gain relevant technical skills that will improve their job prospects, contributing to Target 4.4.

Gender Equality

This project contributes to Target 5.B of SDG 5 which states:
Enhance the use of enabling technology, in particular information and communications technology, to promote the empowerment of women.

By working exclusively with schools with similar ratios of boys to girls and in some cases having more female students, usage of equipment by both genders ensures that no individual is excluded.

Industry, Innovation And Infrastructure

This project contributes to Target 9.C of SDG 9 which states:
Significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020.

By providing 10 schools with computer labs and assistive technology such as projectors, thousands of students have access information and communications technology.

Responsible Consumption And Production

This project contributes to Target 12.5 of SDG 12 which states:
By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse.

ICT Equipment used in projects is donated largely from companies; equipment is data-wiped and refurbished before being sent to projects. Therefore, this project is promoting the reuse of equipment and reducing e-waste.

Next Steps

Looking forward, there are a number of key next steps for the Kenya Digital Schools project. Now that computer labs are fully installed across all schools, students are able to benefit from access and usage of the computers both as part of formal classes and also outside of class.

The trained teachers are able to implement the skills they have gained through the ICDL capacity building and in particular from the ICT in Education module. We therefore expect student educational outcomes to improve, especially levels of ICT skills.

In Year 2 of the project, further training will occur either to new teachers, or teachers who haven't yet passed all modules offered to them. A sample of students across all the schools will be assessed in ICDL Digital Citizen (entry level ICT certification) in order to understand levels of ICT competence among students across the schools.

Summary

In summary, the Kenya Digital Schools project has progressed even with delays caused by the pandemic. All outputs expected in the first year of the project have now been achieved including the installation of computer labs across all schools.

Preparations are being made for activities in the second year of the project including further teacher training and also student testing that will occur later in Year 2, once students have had adequate time to utilise the computer labs and assistive technology.